

liveries of black and scarlet and greenish-yellow, and also the cock bird in process of reverting for the winter to the comparatively dull plumage of his mate.

In an article entitled "The Negro Brain," published in the September issue of the *Century Illustrated Monthly Magazine*, Dr. R. B. Bean rejects the doctrine that the negro is the brother of the white man. After demonstrating that the male Caucasian brain is not only larger than that of the negro, but also differs in shape and by the smaller proportionate amount of grey matter and of connecting fibres, the author sums up as follows:—"The white and the black races are antipodal in cardinal points. The one has a large frontal region of the brain, the other a larger region behind; the one is a great reasoner, the other preeminently emotional; the one domineering, but having great self-control, the other meek and submissive, but violent and lacking self-control when the passions are aroused; the one a very advanced race, the other a very backward one. The Caucasian and the negro are fundamentally opposite extremes in evolution." These premises being admitted, it is clear (despite the fact that a negro may occasionally display exceptional mental powers) that to attempt to educate the two races on the same lines is neither more nor less than folly. Incidentally, the author shows that the American negro, in place of being entirely of the Guinea type, includes representatives of the Bushman and of the Bantu (Kafir) types.

In *Canary and Cage-bird Life* for August 31 Dr. A. R. Galloway records a case of cross-breeding in poultry which well exemplifies the Mendelian law. The two breeds crossed were the silkie bantam and the Pekin bantam, the former characterised by the pure white hair-like plumage, bluish-black skin, and small rose comb and crest, while the latter has the plumage cinnamon-buff, the skin pinkish, and the comb simple. Four years ago, when a silkie cock was mated with a Pekin hen, the hybrid chicks—between twenty and thirty in number—were all buff, although with a tendency to small dark markings. Nevertheless, the buff may be regarded as the dominant colour in the cross, but in the hens, at any rate, the black skin and small rose comb and crest of the silkie were apparent. During the present summer a first-cross buff cock paired with a buff hen of the same cross, and, of the eight chicks thus produced, one was a pure white silkie, two were pure buff Pekins, and five showed intermediate characters with regard to type, colour of skin, and colour and character of feather. This is a close approximation, considering the limited nature of the trial, to Mendel's law, which should give two pure silkies, four intermediates, and two buff Pekins. The five intermediates were as follows:—one a buff Pekin with blackish face and silkie-type of feather; one buff Pekin with blackish face and two or three quills white in each wing; one variegated buff Pekin showing about one-third of plumage white, with Pekin-type of face and silkie-feathers; two dark speckled grey, with blackish faces and a good deal of black markings on the feathers.

SOME curious results of the Californian earthquake are recorded by Prof. Campbell, director of the Lick Observatory, in No. 108 of the Publications of the Astronomical Society of the Pacific. Fortunately, as recorded in these columns on May 10, the observatory itself was not injured. Subsequent work has shown that the meridian circle and the polar axis of the 36-inch refractor show no sign of having shifted. The period of the earth vibrations was so long that the buildings and the instrument foundations had time to follow the movement without undue strain. There is some fear, however, that the financial affairs of

the university and the observatory may be somewhat crippled by the huge losses incurred in property, &c. It is evident from the report that the neighbourhood suffered severely. The motion was chiefly of the horizontal shearing type, and we read of a 'public road which crossed the fault-line at right angles having its contiguous ends permanently displaced some 17 feet. A large tree standing on the edge of the fissure is 24 feet from the small roots it left behind it. A barn which stood exactly over the fissure, with some four-fifths of the structure on the west side, was badly wrecked, but the part of the foundations and superstructure situated on the west side remain, whilst the foundation lying east of the fissure has moved southward, under the barn, through 18 feet. Many similar instances of movement are recorded. About twenty miles westward of Mount Hamilton, on the fault-line, the maximum shift is about  $8\frac{1}{2}$  feet. As all the displacements referred to are in thick, loamy soil, which would tend to lag, it is probable that the shear in the underlying rock stratum is still greater. Some interesting questions as to farm boundaries, latitudes, and azimuths may be expected to arise. A commission, including Profs. Campbell and Leuschner, has been appointed by the Governor to study the scientific aspects of the phenomenon.

IN a letter from Glasgow, Mr. A. McLance suggests that lead should be found in radio-active minerals containing radium. In a paper by Mr. Boltwood in the *Philosophical Magazine* for April, 1905 (p. 613), evidence is given of the existence of lead in all radio-active minerals. Mr. McLance points out that if the atomic weight of radium is taken as 258, as found from spectroscopic observations by Runge and Precht, and the combined atomic weights of the five helium atoms into which the radium atom is believed to dissociate are subtracted from it, the atomic weight of uranium is obtained.

A SUMPTUOUS catalogue of telescopes and accessories has been published by the firm of Carl Zeiss, of Jena, under the specific designation "Astro:8." Especially compiled for scientific amateur astronomers, the catalogue only deals with telescopes of less aperture than 8 inches. Several new constructions are now catalogued and illustrated for the first time. In addition to the numerous azimuthal and equatorial telescopes, the catalogue contains illustrations and prices of a large variety of eye-pieces, sun oculars, prominence and other spectroscopes, position micrometers, the stereo-comparator, &c., and should be consulted by all astronomers in need of telescopes or accessories.

IN No. 72 of the *Chemiker Zeitung* Dr. P. N. Raikow, of the University of Sophia, describes a simple method of boring any number of small holes through glass tubing, both thin and thick, watch glasses, flasks, &c. The part which it is desired to pierce is carefully warmed up in a Bunsen flame, and then a red-hot needle worked bradawl-wise against the particular spot, which naturally must not be so hot that any slight pressure causes the walls of the vessel or tube to be forced out of shape. The broken stem of a thermometer is said to provide an especially good handle for the eye end of the needle to be inserted into.

#### OUR ASTRONOMICAL COLUMN.

JUPITER'S SIXTH SATELLITE.—A telegram from Prof. Campbell, published in No. 4119 of the *Astronomische Nachrichten*, states that Jupiter's sixth satellite was observed by its discoverer, Prof. Perrine, on August 26-9656 (G.M.T.). Its position angle at that time was  $209^{\circ}.92$ , and its distance from Jupiter  $1734''$ .

HOLMES'S COMET (1906f).—In No. 4121 of the *Astronomische Nachrichten* Prof. Max Wolf states that he has measured the position of Holmes's comet on the plate secured on August 28. He gives the exact position, for 1906-0, at the time of discovery, and this shows that corrections of +6.79s. and +28".2 are necessary to Dr. Zwiers's ephemeris. As the comet is extremely faint, mag.=15.5, a continuation of the ephemeris is not given here, but will be found in No. 4085 of the *Astronomische Nachrichten*.

OBSERVATIONS OF SOLAR PHENOMENA, 1906.—The results of the observations of sun-spots, faculae, and prominences made during the first semester of the present year at the Catania Observatory are published by Prof. Mascari in No. 8, vol. xxxv., of the *Memorie della Società degli Spettroscopisti Italiani*.

The mean daily frequency of spots was higher during the second than during the first quarter, the respective numbers being 5.68 and 4.50; the faculae behaved similarly. For prominences the reverse was the case, there being a mean daily frequency of 4.38 prominences during the first quarter and 3.47 during the second. Discussing the results in relation to the time of the solar maximum, Prof. Mascari places the epoch of maximum spots at 1905.2, and that of faculae and prominences in the last quarter of 1905 or the first quarter of 1906.

OBSERVATIONS OF JUPITER.—The observations of Jupiter made by Mr. Denning during the last opposition showed that the rotation period of the Great Red Spot and its Hollow, in the south equatorial belt, between March 24 and May 4, was 9h. 55m. 40.6s., a period practically conformable with that of system ii. of the ephemerides. On observing the phenomena on August 9, however, he found that they were far in advance of their predicted places, an observation confirmed by the Rev. T. E. R. Phillips. From this it appears that the rotation period between May 4 and August 8 was only 9h. 55m. 33.8s. Mr. Denning supposes that the conjunction of the dark material, forming the south tropical disturbance, with the Red Spot, in June last, may have caused the marked acceleration of the latter, as it has done on several former occasions. The present increase of velocity is, however, much greater than any previously observed, and these features appear to have been observable for seventy-five years (the *Observatory*, No. 374).

In the September number of the *Bulletin de la Société astronomique de France* M. Flammarion directs attention to a remarkably sudden change in the visibility of the north equatorial band on Jupiter. This band has been diminishing since the end of 1903, and an observation made by M. Benoit, at Juvisy, on April 10, 1906, showed that it was almost completely invisible. After its conjunction with the sun, Jupiter was observed again on July 17 by M. Quénisset, who was astonished to find that the north equatorial band was completely reformed, being even broader, and at some points darker, than the south equatorial band. A drawing, made by M. Quénisset on July 23, is reproduced with the article.

THE KODAIKANAL OBSERVATORY.—An interesting popular account of India's solar physics observatory, situated at Kodaikanal, on the Palani Hills, appears in the July number of the *Madras Christian College Magazine*. Mr. Monteith Macphail, the writer of the account, lately visited the observatory, and was evidently impressed with its situation and its work. The altitude of the observatory is about 7700 feet, in an atmosphere of exceptional transparency, and amid beautiful surroundings.

Although located in Madras, the institution was founded, and is supported, by the Government of India, thus having a national and not merely a provincial status. Its chief *raison d'être* is the continuous study of the sun, with the ultimate idea of elucidating still further the indicated relationships between solar and terrestrial atmospheric phenomena. To a country like India, the value of possessing the fullest possible knowledge of these relationships cannot be overestimated, and that is the reason why the Government of India has seen fit to found and to support this observatory and its equipment in the most favourable situation at its command. Sun-spots, their spectra, and prominences on the solar limb, are observed visually,

and spectroheliograms of the solar disc and limb are taken on every day on which the atmospheric conditions are suitable. Magnetical and seismological records are also taken.

## CHEMISTRY AT THE BRITISH ASSOCIATION.

IT was somewhat noticeable that the trend of the proceedings in Section B this year was in the direction of applied chemistry; general problems on the theoretical side of the science came under discussion in Section A; if this indicate either that this section is becoming alive to the importance of chemistry to physics or a rapprochement of the two sections, it is a good sign, but it is not satisfactory if it mean the neglect of broad considerations by the chemist.

Reports were presented by Mr. S. S. Pickles, on the chemistry of rubber; on that of gums, by Mr. H. H. Robinson; and on the hydrolysis of sugars, by Mr. R. J. Caldwell. These gave rise to more or less interesting discussions and were a valuable feature of the meeting. Discussion also centred round a paper by Dr. T. A. Henry, on the production of hydrogen cyanide in plants. The joint discussion with the physiologists on diet was of great interest, although it was mainly developed in physiological and sociological directions.

The proceedings opened on the Thursday, August 2, with an important paper by Messrs. S. Leetham and Wm. Cramp, who have been engaged in perfecting an apparatus for the production of an active mixture of gases which may be used for bleaching and sterilising purposes, particularly in bleaching flour. The apparatus consists of an alternator, transformer, ozoniser and spark box, the two latter being in series on the high-tension side of the transformer; on passing a current of air through the ozoniser and then through the spark box a gaseous mixture is produced, containing minute amounts of ozone and oxides of nitrogen, which has a very remarkable bleaching and sterilising action on flour; the process is already one of considerable commercial value. The bleaching action appears to be an oxidation effect.

The authors have studied in great detail the behaviour of the different types of electric discharge and the influence of such factors as the number and distance apart of the discharge points, shape of the points, the air velocity and the frequency. The conclusion arrived at is that ozonisation is not a mere induction effect. In commenting on the paper, Prof. Armstrong dwelt on the importance of manufacturers taking interest in science, and referred to the work as an illustration of the advantages of such co-operation.

Following a short paper by Prof. van Romburgh, of Utrecht, on the 1:3:5-hexatrien, reports were read of the committees on dynamic isomerism, on hydro-aromatic substances and on aromatic nitro-amines. The rest of the morning was devoted to inorganic chemistry, papers being contributed by Mr. A. Vernon Harcourt, on the effect upon the concentration of a solution of the presence of an excess of undissolved salt; by Mr. G. Beilby, on the crystallisation of gold in the solid state; and by Prof. H. A. Miers and Miss F. Isaac, on the temperature at which water freezes in sealed tubes; this is found to be very considerably below that at which solidification takes place in open vessels.

The greater part of Friday, August 3, was devoted to a discussion on the production of hydrogen cyanide in plants, introduced by Prof. Dunstan, who pointed out that in the case of both *Lotus arabicus* and *Sorghum vulgare* the cyanide was formed only during the early stages of growth, and that it was missing in the mature plant. The fully-grown *Lotus* vetch is much used as a fodder plant in the Nile valley, but many fatal cases of poisoning have been caused through its use in the immature state. Hydrogen cyanide has also been detected in Java beans, of which there are several varieties; the maximum amount is found in the dark beans, and it is only safe to use the light bean. In the flax plant, which also affords hydrogen cyanide, the maximum amount is produced at an inter-